

Claims

We Claim:

1. In an agricultural vehicle having a frame supported for movement over the ground by at least two wheels and an operator cab, axle structure for mounting and adjustably spacing the wheels from the frame, the axle structure comprising:
 - an adjustable axle member supported from and movable relative to the frame for adjusting the spacing between the wheels;
 - a sensor providing a signal indicative of the movement of the adjustable axle member; and
 - an electronic circuit connected to the transducer and responsive to the signal for providing a readout indicating wheel spacing.
2. The axle structure set forth in claim 1 wherein the sensor comprises a switch located adjacent to the adjustable axle member and switch actuating structure movable with the adjustable axle member.
3. The axle structure set forth in claim 2 wherein the sensor comprises a proximity switch, and the switch actuating structure comprises a plurality of spaced members located on the adjustable axle member.
4. The axle structure of claim 2 wherein the adjustable axle member comprises a first member telescopingly received within a second member, and wherein the sensor is supported from the second member and the first member includes uniformly spaced actuating structure, the actuating structure cooperating with the sensor to provide a pulse signal indicative of axle member movement.
5. The axle structure set forth in claim 1 including motor structure connected to the adjustable axle member and to the electronic circuit, wherein the electronic circuit comprises a controller having an input device for selecting desired wheel spacing, the motor structure responsive to the controller to automatically provide the selected wheel spacing.
6. The axle structure set forth in claim 5 wherein the controller includes a vehicle condition input, and wherein the controller activates the motor structure to change wheel spacing only upon detection of the presence of a preselected vehicle operating condition.

7. The axle structure set forth in claim 5 including a second adjustable axle member supporting a third wheel and connected to the motor structure, and wherein the controller automatically and simultaneously moves the first and second adjustable axle members to adjust the wheel spacing.

8. In an agricultural vehicle having a frame supported for movement over the ground by at least two wheels, and an operator cab supported by the frame, axle structure for mounting and adjustably spacing the wheels, the axle structure comprising:

an adjustable axle member supported from and movable relative to the frame for adjusting the spacing between the wheels;

a transducer responsive to the movement of the first adjustable axle member and providing a signal indicative of the position of the first adjustable axle member;

an electronic controller responsive to the signal for providing a readout indicating wheel spacing, the controller including a control output; and

motor structure connected to the adjustable axle member and to the control output of the electronic controller for moving the adjustable axle member relative to the first axle member.

9. The axle structure set forth in claim 8 including a display device located in the cab and connected to the controller providing an indication of the spacing of the wheels.

10. The axle structure set forth in claim 9 further wherein the controller includes a desired wheel spacing input, and the controller is responsive to the desired wheel spacing input to automatically operate the motor structure to provide desired wheel spacing.

11. The axle structure set forth in claim 9 wherein the controller includes an input for receiving a vehicle condition signal, and the controller is responsive to the vehicle condition signal to prevent operation of the motor structure under preselected vehicle operating conditions.

12. The axle structure set forth in claim 8 further comprising second, third and fourth adjustable axle members supported from the frame and connected to the

motor structure, each of the first, second, third and fourth axle members supporting a ground engaging wheel, and wherein the motor structure is responsive to the electronic controller to simultaneously move a plurality of the adjustable axle members to adjust wheel spacing.

13. The axle structure set forth in claim 12 wherein the electronic controller includes an input device for selecting desired wheel spacing, and a readout device for providing an indication of the actual wheel spacing.

14. The axle structure as set forth in claim 8 wherein the first axle member includes index structure cooperating with the transducer to provide a signal in response to movement of the axle member.

15. The axle structure set forth in claim 14 wherein the transducer comprises a non-contact transducer, and the index structure comprises regularly spaced transducer exciting members providing a signal to the controller as the axle member is moved.

16. The axle structure as set forth in claim 14 wherein the index structure provides a pulsed signal, the number of pulses provided dependent on amount of movement of the axle member.

17. In a vehicle having a frame supported for movement over the ground by at least two wheels, axle structure for mounting and adjustably spacing the wheels, the axle structure comprising:

- an adjustable axle member supported from and movable relative to the frame for adjusting the spacing between the wheels;

- a motor member connected to the adjustable axle member for moving the adjustable axle member;

- a transducer supported adjacent the adjustable axle member and providing a signal indicative of the movement of the adjustable axle member;

- an electronic controller connected to the transducer and responsive to the signal for providing a readout indicating wheel spacing, the controller including a control output; and

- a motor member connected to the adjustable axle member and to the control output of the electronic controller for moving the adjustable axle member.

relative to the first axle member.

18. The axle structure as set forth in claim 17 wherein the controller includes a vehicle condition input for receiving a vehicle condition signal, and wherein the electronic controller is responsive to the vehicle condition signal for limiting movement of the adjustable axle member under preselected vehicle operating conditions.

19. The axle structure as set forth in claim 17 wherein the controller includes means for checking wheel spacing for at least one limit position and providing an error signal if the checked wheel spacing is outside a range of acceptable wheel spacings for the limit position.

20. The axle structure as set forth in claim 17 including a plurality of simultaneously adjustable axle members, wherein the readout includes a desired wheel spacing input for operator entry of wheel spacing settings and the controller is responsive to the wheel spacing settings for moving the plurality of adjustable axle members.